10.1 Defining Convergent and Divergent Infinite Series

Calculus Name: _____ **CA #2**

1. **Calculator active.** Given the infinite series: $3 - \frac{9}{2} + \frac{27}{4} - \frac{81}{8} + \frac{243}{16} - \cdots$, find the sequence of partial sums $S_1, S_2, S_3, S_4,$ and S_5.

2. Find the nth partial sum for the infinite series $\sum_{n=1}^{\infty} \frac{1}{6^n}$.

3. The infinite series $\sum_{n=1}^{\infty} \frac{3}{5^{n+1}}$ has nth partial sum $S_n = \frac{3}{4}\left(\frac{1}{5} - \frac{1}{5^{n+1}}\right)$. What is the sum of the series?

4. If the infinite series $\sum_{n=1}^{\infty} a^n$ has nth partial sum $S_n = \frac{3^{2n+1}-1}{3^n}$ for $n \geq 1$. What is the sum of the series?

5. Does the series $\sum_{n=1}^{\infty} \left(\frac{2}{n} - \frac{2}{n+2}\right)$ converge or diverge? If it converges find its sum.

Answers to 10.1 CA #2

1. 3, −1.5, 5.25, −4.875, 10.3125	2. $S_n = \frac{1}{5}\left(1 - \frac{1}{6^n}\right)$	3. $\frac{3}{20}$	4. Diverges	5. Converges, sum = 3